



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,613	12/22/2004	Sylvie Coulon	263433US41PCT	7978

22850 7590 06/01/2006

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

WIEHE, NATHANIEL EDWARD

ART UNIT PAPER NUMBER

3745

DATE MAILED: 06/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/517,613	COULON ET AL.	
	Examiner	Art Unit	
	Nathan Wiehe	3745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 02082005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 08 February 2005 is noted. The submission is in compliance with the provisions of 37 CFR 1.97 and 1.98. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admission of prior art, hereinafter "APA" in view of Arilla et al. (EP 1 211 381 A1), hereinafter "Arilla". APA, specifically Fig. 1, discloses a turbomachine including a sealing device comprising:

- a turbine disk (3) having an upstream clamping annulus (3a),
- a flange (5) spaced upstream of the disk (3) forming a cavity (12),
- a first air circuit secured to the inner casing and delivering a first flow of cooling air through main injectors (15) and holes (11) in the flange (5),
- a discharge labyrinth (18),

a main under-injector labyrinth (22), and
an over-injector labyrinth (24).

APA's sealing device provides a second flow of cooling air inside a second circuit defined by enclosures delimited by the inner casing and the rotor, by the labyrinths, which is evacuated in the upstream venting cavity of the disk. APA does not disclose the use of three radially spaced apart labyrinths between the flange and the annular structure. Arilla discloses a turbomachine including a sealing device including a rotor (3), flange (10), a first cooling circuit, an under-injector labyrinth and an over-injector labyrinth (20) including three radially spaced apart labyrinths located between the flange (10) and the annular structure. Arilla's three labyrinth arrangement compensates and adjusts the centrifugal loading of the flange. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the sealing device of APA by including three radially spaced apart labyrinths as taught by Arilla in order to compensate and adjust for the centrifugal loading of the flange.

Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Arilla as applied to claim 7 above, and further in view of Di Salle et al. (US 5,984,630), hereinafter "Di Salle". The modified invention of APA discloses the invention substantially as claimed except for the use of cooling air being fed into a cavity between the three labyrinths. Di Salle teaches an over-labyrinth seal in a turbomachine having three radially and axially displaced sealing elements and forming two cavities (22,52) there between. One of the cavities (52) is feed with cooling air from the corresponding second circuit (20) through secondary injector holes (50) sloped relative

Art Unit: 3745

to the rotation direction of the rotor (Di Salle column 2, lines 42-53). Di Salle's secondary injector arrangement increases turbine disk rim cooling effectiveness leading to reduced metal temperatures (Di Salle column 2, lines 17-24). It would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify the three labyrinth over-injector seal of APA by including a sloped secondary injector feeding cooling air into a cavity formed between the labyrinths as taught by Di Salle in order to increase turbine rim cooling effectiveness and reduce metal temperatures

Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited US patent (6,776,573) issued to Arilla et al. corresponds to the EP publication of Arilla et al. used in the rejections above. The US patent (7,048,497) issued to Arilla et al. discloses a turbine ventilation structure similar to that claimed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan Wiehe whose telephone number is (571)272-8648. The examiner can normally be reached on Mon.-Thur. and alternate Fri., 7am-4:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look can be reached on (571)272-4820. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3745

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Nathan Wiehe
Examiner
Art Unit 3745



EDWARD K. LOOK
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700

5/26/06